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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,622	03/26/2001	Anwar Chitayat	99AN122-E	8382

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EXAMINER	
MULLINS, BURTON S	
ART UNIT	**PAPER NUMBER**
2834	

DATE MAILED: 10/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/817,622	CHITAYAT ET AL.
	Examiner	Art Unit
	Burton S. Mullins	2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5)☐ Claim(s) ____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) ____ is/are objected to.

8)☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on ____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on ____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). ____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 4, 7-10 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kemmer (US 4,234,831) in view of Spinner et al. (US 5,771,174). Kemmer teaches an integrated rotary-linear actuator system, comprising: a plunger (rotor 3) movable along and rotatable about a longitudinal axis extending through the plunger (and shaft 6); a coil system having coils S1-S8 arranged to, when energized, interact with the plunger to move the plunger in at least one of a rotational mode and in a linear mode (abstract); an amplifier (part of inverter with outputs A1-A8; Fig.4) coupled to the coils and operative to provide electrical energy to energize the coils; and a control system coupled with the amplifier (converter/decoder with input; Fig.4). Kemmer does not teach a network interface operative to receive control information from the actuator.

Spinner teaches a distributed intelligence control system for controlling plural actuators 26 (Fig.2) and respective controllers 30 connected by connections 32 with a network bus 24 and gateway or "network interface" 22 (Fig.1). The network interface interprets messages from the supervisory control system (computer) 20 and converts and distributes this information to the actuator controllers. The network interface also converts and transmits

information originating from the actuator, e.g., position and status, to the control system (c.4, lines 23-30). Such a LAN network as in Spinner is desirable as a means of communication between a central host controller and a series of actuators (c.2, lines 49-52).

It would have been obvious to one of ordinary skill at the time of the invention to modify Kemmer and provide a network interface per Spinner since this would have been a desirable means of establishing communication between a central host and an actuator.

Regarding claims 2 and 16, though Kemmer teaches only one magnet or "motor", duplication of parts of an invention, i.e., providing an "array of magnets" such that plural motors are provided, has been held to involve ordinary skill. St. Regis Paper Co. v. Bemis Co. 193 USPQ 8, (7th Cir. 1977).

Regarding claim 4, the motor support (tube 7) in Kemmer comprises a bearing support and a housing that define a well operative to receive the plunger (rotor 3), the plunger being supported by bearings 4 located between the plunger and the bearing support, such that the plunger is axially movable along the longitudinal axis between a retracted position and an extended position and rotatable about the longitudinal axis (Fig. 1).

Regarding claims 9-10, the actuator controllers in Spinner comprise "sensors" since they transmit actuator information, e.g., position and status, to the host control system. The host includes program data operative to program operating characteristics of at least part of the integrated rotary-linear actuator system based on evaluation of the condition data from the integrated rotary-linear actuator system (c.7, line 9-c.8, line 34).

Regarding claim 17, Spinner includes a method for controlling plural actuators including a network interface to enable communication over an associated network, the method

comprising: receiving control information (from host 20) at the network interface of the integrated rotary-linear actuator system via the associated network; and programming operating parameters of the rotary-linear actuator system based on the received control information (various parameters of the control algorithm are shown in c.6, lines 44+).

Regarding claim 18, the communications interface of Spinner including a network interface card (c.5, lines 1-28) would use a network protocol. Regarding claim 19, the control information includes program data, the operating parameters of the rotary-linear actuator system being programmed based on the program data (c.6, lines 5+). Regarding claim 20, Spinner's system senses conditions, e.g. position and state, of the actuators and provides a sensor signal indicative of the sensed at least one condition, which is sent from the actuator to the computer 20 via the network interface 22 using the network protocol. Regarding claim 21, the control information includes program data (algorithm parameters given in c.6, line 44+) to program the operating parameters of at least part of the actuator based on evaluation of the condition data sent from the actuator.

3. Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo et al. (US 4,644,205) in view of Spinner et al. (US 5,771,174). Sudo teaches a rotary-linear actuator system, comprising: a motor support (stationary member 12) having a well (Fig.2); a plunger (floating member 14) supported for movement in at least part of the well so as to enable axial movement of the plunger relative to the well along a longitudinal axis of the plunger and rotational movement of the plunger about the longitudinal axis; an array of magnets (34a-34d/36a-36d) associated with the plunger (Fig.2); a first set of coils 42/44 (Fig.2) arranged to, when energized, apply an electric field that interacts with the array of

magnets and provides an axial force to drive the plunger element in a linear mode (c.3, line 32); a second set of coils 50a-50h (Fig.2) arranged to, when energized, apply an electric field that interacts with the array of magnets and provides a tangential force to drive the plunger element in a rotational mode (c.3, line 47); and an integrated control system 66 which selectively energizes the first and second sets of coils to effect movement of the plunger in at least one of the linear and rotational modes.

Sudo does not have a network interface operative to receive control information via an associated network.

Spinner teaches a distributed intelligence control system for controlling plural actuators 26 (Fig.2) and respective controllers 30 connected by connections 32 with a network bus 24 and gateway or "network interface" 22 (Fig.1). The network interface interprets messages from the supervisory control system (computer) 20 and converts and distributes this information to the actuator controllers. The network interface also converts and transmits information originating from the actuator, e.g., position and status, to the control system (c.4, lines 23-30). The network interface also converts and transmits information originating from the actuator, e.g., position and status, to the control system (c.4, lines 23-30). Such a LAN network as in Spinner is desirable as a means of communication between a central host controller and a series of actuators (c.2, lines 49-52).

It would have been obvious to one of ordinary skill at the time of the invention to modify Sudo and provide a network interface per Spinner since this would have been a desirable means of establishing communication between a central host and an actuator.

Regarding claim 12, the communications interface of Spinner including a network interface card (c.5, lines 1-28) would use a network protocol. Regarding claim 13, the control information includes program data, the operating parameters of the rotary-linear actuator system being programmed based on the program data (c.6, lines 5+). Regarding claim 14, Spinner's system senses conditions, e.g. position and state, of the actuators and provides a sensor signal indicative of the sensed at least one condition, which is sent from the actuator to the computer 20 via the network interface 22 using the network protocol. Regarding claim 15, the control information includes program data (algorithm parameters given in c.6, line 44+) to program the operating parameters of at least part of the actuator based on evaluation of the condition data sent from the actuator.

4. Claims 1-10 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo et al. (US 4,644,205) in view of Spinner et al. (US 5,771,174) and Gerard (US 4,751,4347). Sudo teaches a rotary-linear actuator system, comprising: a motor support (stationary member 12) having a well (Fig.2); a plunger (floating member 14) supported for movement in at least part of the well so as to enable axial movement of the plunger relative to the well along a longitudinal axis of the plunger and rotational movement of the plunger about the longitudinal axis; an array of magnets (34a-34d/36a-36d) associated with the plunger (Fig.2); a first set of coils 42/44 (Fig.2) arranged to, when energized, apply an electric field that interacts with the array of magnets and provides an axial force to drive the plunger element in a linear mode (c.3, line 32); a second set of coils 50a-50h (Fig.2) arranged to, when energized, apply an electric field that interacts with the array of magnets and provides a tangential force to drive the plunger element in a rotational mode (c.3, line 47); and an

integrated control system 66 which selectively energizes the first and second sets of coils to effect movement of the plunger in at least one of the linear and rotational modes.

Sudo does not have a network interface operative to receive control information via an associated network. Neither does Sudo teach an amplifier, per se.

Spinner teaches a distributed intelligence control system for controlling plural actuators 26 (Fig.2) and respective controllers 30 connected by connections 32 with a network bus 24 and gateway or "network interface" 22 (Fig.1). The network interface interprets messages from the supervisory control system (computer) 20 and converts and distributes this information to the actuator controllers. The network interface also converts and transmits information originating from the actuator, e.g., position and status, to the control system (c.4, lines 23-30). The network interface also converts and transmits information originating from the actuator, e.g., position and status, to the control system (c.4, lines 23-30). Such a LAN network as in Spinner is desirable as a means of communication between a central host controller and a series of actuators (c.2, lines 49-52).

Gerard teaches a linear motor and servo loop drive circuit (Fig.1) including an amplifier 40 which supplies current to the coil 28 (c.3, lines 40-41).

It would have been obvious to one of ordinary skill at the time of the invention to modify Sudo and provide a network interface per Spinner since this would have been a desirable means of establishing communication between a central host and an actuator, and to further include an amplifier in the drive control per Gerard since amplifiers would have been desirable to supply current to the coils.

Regarding the remaining claims, see the discussion in relevant sections of above.

5. Claims 1-4, 7-10 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kemmer in view of Lee (US 4,692,678). Kemmer teaches an integrated rotary-linear actuator system, comprising: a plunger (rotor 3) movable along and rotatable about a longitudinal axis extending through the plunger (and shaft 6); a coil system having coils S1-S8 arranged to, when energized, interact with the plunger to move the plunger in at least one of a rotational mode and in a linear mode (abstract); an amplifier (part of inverter with outputs A1-A8; Fig.4) coupled to the coils and operative to provide electrical energy to energize the coils; and a control system coupled with the amplifier (converter/decoder with input; Fig.4).

Kemmer does not teach a network interface operative to receive control information from the actuator.

Lee teaches a motor closed-loop servo system including a plunger servo-motor Z with armature 18 and plural field coils 15/16 (Fig.5) coupled to a power amplifier Y (Fig.3), and a control system X coupled with the amplifier, the control system X having a network interface operative to receive correction or control signal information from control computer W (c.5, lines 14-25), the control system X being operative to control current signals (signals Q and T from amplifier Y) to the coils 15/16 to effect precise movement of the armature 18 based on the control information received from the computer W via the network interface (c.5, lines 14-25). Lee's integrated system provides a linear motor with a great degree of flexibility, efficiency, and accuracy required in sensitive instruments such as optics, lasers, guidance, robotic and medical perfusion technologies (c.2, lines 13-29).

It would have been obvious to one having ordinary skill to modify Kemmer's motor and provide an integrated servo control system including a network interface of Lee since this would have provided the motor with a desirable degree of flexibility, efficiency and accuracy.

Regarding claims 2 and 16, though Kemmer teaches only one magnet or "motor", duplication of parts of an invention, i.e., providing an "array of magnets" such that plural motors are provided, has been held to involve ordinary skill. St. Regis Paper Co. v. Bemis Co. 193 USPQ 8, (7^{th} Cir.1977).

Regarding claim 4, the motor support (tube 7) in Kemmer comprises a bearing support and a housing that define a well operative to receive the plunger (rotor 3), the plunger being supported by bearings 4 located between the plunger and the bearing support, such that the plunger is axially movable along the longitudinal axis between a retracted position and an extended position and rotatable about the longitudinal axis (Fig.1).

Regarding claims 7-10, Lee's interface inherently includes a network protocol connecting it with various internal computer hardware via a bus (Fig.4), and the interface X includes various sensors transmitting voltage magnitude, current, displacement and velocity signals A-F to the computer via the network interface (Fig.3). Algorithms or programs are run by the computer (c.2, lines 7-12).

Regarding claims 17-21, the method is carried out by the apparatus of Kemmer and Lee. Lee in particular teaches the data transfer method between the computer W and motor Z via interface X.

6. Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo et al. (US 4,644,205) in view of Lee. Sudo teaches a rotary-linear actuator system, comprising:

a motor support (stationary member 12) having a well (Fig.2); a plunger (floating member 14) supported for movement in at least part of the well so as to enable axial movement of the plunger relative to the well along a longitudinal axis of the plunger and rotational movement of the plunger about the longitudinal axis; an array of magnets (34a-34d/36a-36d) associated with the plunger (Fig.2); a first set of coils 42/44 (Fig.2) arranged to, when energized, apply an electric field that interacts with the array of magnets and provides an axial force to drive the plunger element in a linear mode (c.3, line 32); a second set of coils 50a-50h (Fig.2) arranged to, when energized, apply an electric field that interacts with the array of magnets and provides a tangential force to drive the plunger element in a rotational mode (c.3, line 47); and an integrated control system 66 which selectively energizes the first and second sets of coils to effect movement of the plunger in at least one of the linear and rotational modes.

Sudo does not have a network interface operative to receive control information via an associated network.

Lee teaches a motor closed-loop servo system including a plunger servo-motor Z with armature 18 and plural field coils 15/16 (Fig.5) coupled to a power amplifier Y (Fig.3), and a control system X coupled with the amplifier, the control system X having a network interface operative to receive correction or control signal information from control computer W (c.5, lines 14-25), the control system X being operative to control current signals (signals Q and T from amplifier Y) to the coils 15/16 to effect precise movement of the armature 18 based on the control information received from the computer W via the network interface (c.5, lines 14-25). Lee's integrated system provides a linear motor with a great degree of flexibility,

efficiency, and accuracy required in sensitive instruments such as optics, lasers, guidance, robotic and medical perfusion technologies (c.2, lines 13-29).

It would have been obvious to one having ordinary skill to modify Sudo's motor and provide an integrated servo control system including a network interface of Lee since this would have provided the motor with a desirable degree of flexibility, efficiency and accuracy.

Regarding claim 12, the communications interface of Lee would use a network protocol to connect the interface with the various computer parts via a bus (Fig.4). Regarding claims 13-15, Lee teaches algorithms performed by the computer W using various sensed parameters to generate control signas (c.7, lines 50-56).

Response to Arguments

7. Applicant's arguments filed August 29, 2002 have been fully considered but they are not persuasive. Further, note additional grounds of rejection which include US 4,692,678 to Lee.

Applicant argues Spinner does not selectively energize coils to move the plunger, but rather teaches a controller which uses setpoints and the position of the actuator to determine error, then determines a direction the actuator must move and asserts a slice lip open or close control signal.

While this is correct, applicant fails to address the fact that the base reference Kemmer teaches selective energization of the coils S1-S8 by a programmed control system to move the plunger in at least one of a rotational and linear mode (abstract; c.2, lines 43-56; c.3, lines 1-30 and 36-38; c.4, lines 58-60). Similarly, with regard to Sudo, applicant fails to consider that

Sudo teaches a control system 66 which selectively energizes first and second sets of axial and radial coils 42/44 and 50a-50h to axially move or rotate the plunger 14. The differences between both Kemmer and Sudo and applicant's invention are: 1) their respective motors are not interfaced with a network; and 2) their respective control systems (in Kemmer, the trigger circuit comprising amplifier and converter/decoder with input, Fig.4; in Sudo, control system 66, Fig.10) do not receive control information via the network interface.

Spinner teaches a local area network which provides a bi-directional communication link between a host control system and actuator controllers (as well as between adjacent actuator controllers). Spinner's network is shown in Fig.1 and includes network interface or gateway 22. The motors 26 are linked with the host control system 20 via the network interface 22. Desired profile information, i.e., "control information," is transmitted from the host control system 20 to the actuator controllers 30 (abstract).

Spinner teaches that is it well known in the paper industry that CD profile control actuators can be networked using some form of a serial communication link whereby information (e.g., control actions, setpoints, status, positions) may be transmitted bidirectionally between a supervisory or host control system and the individual actuators (c.1, lines 62-66 and c.2, lines 1-31). In other words, Spinner teaches that the actuator controllers 30 receive control information transmitted from the host control system 20 via the network interface 22. Such a LAN network as in Spinner is desirable as a means of communication between a central host controller and a series of actuators (c.2, lines 49-52).

Regarding applicant's argument that the controller 30 in Spinner "does not include the network interface 22," the examiner notes that the claim language in claim 1 reads "the control

system having a network interface operative to receive control information" and that this is broad enough to include the arrangement in Spinner's (Fig.1) wherein the individual actuator controllers 30 share the network interface 22.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Spinner clearly teaches that a LAN network provides a desirable means of communication between a central host controller and a series of actuators (c.2, lines 49-52). Such a LAN network would necessarily include a network interface between the host and the actuators. Spinner's actuators are within the same field as the motors used as drives, relays and positioning devices disclosed by Kemmer and Sudo.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Roth and Izawa teach linear motors.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 305-7063. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be

reached on 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are 305-1341 for regular communications and 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0956.

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
October 10, 2002